

REMARKS

Claim 1 has been amended to reinforce the fact, as was previously apparent, that the dispersant is the reaction product of polyisobutylene amine with 1,2,4-benzenetricarboxylic anhydride.

The following remarks include replies to comments in the Advisory Action.

The rejection of claim 1 under 35 U.S.C. § 102 as anticipated by Franz is respectfully traversed.

Franz relates to a polybutyl or polyisobutyl alcohol of the formula I, namely $R-CH_2-[O-CH_2]_n-OH$, and their (poly)alkoxylates or esters. Nevertheless, the Office Action of February 10, 2009 asserts that Franz teaches the reaction product of trimellitic anhydride and polyisobutyl amine, citing lines 30 and 40 in column 5, and asserting that while there is no teaching that the reaction product is a polyimide, the imide ring is “inherently formed” because the reactions conditions in the reference (180°C for 6 hours) are “comparable” to those in the application (140°C for 4 hours). It is respectfully submitted these assertions do not accurately reflect the statements in Franz and also ignore a specific statement as to the nature of the reaction product.

The passages including the lines cited from column 5 (column 5, lines 20-42) read as follows (with emphasis added):

For the synthesis of ashless dispersants, suitable acids are di-, tri- and tetracarboxylic acids, which must be only partially esterified in order to permit the introduction of further polar groups with the aid of ammonia, an amine or an amide. The amides, imides or ammonium or amine salts obtained, depending on the reaction conditions, possess in some cases outstanding dispersing properties. In

a particularly preferred embodiment, phthalic anhydride or trimellitic anhydride is reacted with polyisobutyl alcohol in a molar ratio of 1:1. This process leads to products of high chemical purity. In another reaction stage, the still free carboxylic acid groups are reacted with, for example, polyamines, such as diethylenetriamine, triethylenetetraamine or triethylenepentamine, half a mole of amine being added per free carboxylic acid group. By maintaining a reaction temperature of 180° C. for 6 hours, amide structures are obtained. Mineral oil is preferably used as a solvent for these highly viscous substances.

The polybutyl- or polyisobutylamines of the general formula III which are proposed for combination with, in particular, the polyisobutyl alcohol can be prepared by....

It will be appreciated that the first sentence in the paragraph mentioning trimellitic acid concerns reacting a partially esterified polyacid with an amine. Trimellitic acid is not a partially esterified polyacid. Later in the paragraph, it is stated that the partially esterified polyacid is reacted with a polyamine but not only does that statement make no mention of polyisobutylamine, it also states the resulting reaction product is an amide. There is a reference to reacting trimellitic acid but it is reacted with an equal molar amount of polyisobutyl alcohol, thereby forming a partly esterified polyacid, and the esterified acid is then reacted with a polyamine. Nowhere in this paragraph is a reaction of trimellitic acid with polyisobutylamine taught or suggested.

The next paragraph in Franz, which refers to polyisobutylamine concerns how that a material is prepared, a preparation which does not involve trimellitic acid. The paragraph notes that the polyisobutylamine is “proposed for combination with, in particular, the polyisobutyl alcohol”. What that combination constitutes is explained at column 3, lines 15 et seq. where it is made clear the combination is a mixture and not a reaction product. There is nothing in this paragraph which teaches or suggests the reaction of polyisobutylamine with anything.

It will be appreciated from this review that the portions of Franz to which reference has been made do not teach or suggest reacting trimellitic anhydride with polyisobutylamine. At best, it could be argued that a reaction of partly esterified trimellitic anhydride with polyisobutylamine is suggested, but even so, Franz explicitly teaches the product of that reaction is an amide.

Two further comments about the rejection are appropriate. First, any assertion of inherency (such as the imide ring is “inherently formed”) requires certainty, and a possibility or even a probability is insufficient as a matter of law. *In re Robertson*, 49 USPQ2d 1949 (Fed. Cir. 1999). As a result, reference to “comparable” reaction conditions is insufficient to establish inherency even if it were permissible (and it is not) to ignore the explicit statement that a different type of product results.

Second, in response to the comment about open language (“comprising”) permitting the presence of other materials in the reaction mixture, the claim has always require the presence of the specified reaction product and, as discussed above, it is not present.

The Advisory Action states that “Franz teaches reaction of trimellitic anhydride with alcohol at a ratio of 1:1, meaning that only 1 acid group of TMA can be esterified.” However, the Advisory Action fails to acknowledge that the resulting product is a dicarboxylic acid anhydride whereas trimellitic acid anhydride is a tricarboxylic acid anhydride. These are not the same. The Advisory Action continues by asserting that the anhydride of the dicarboxylic acid anhydride reacts with amine forming an imide. This assertion is directly contrary to Franz’s statement that the reaction product is an amide. See, column 5, lines 31-37.

Withdrawal of this anticipation rejection is respectfully requested. It is noted that a rejection under Section 103 would be untenable because the property of the reaction product of claim 1 of being a dispersant for a colorant constitutes a surprising and unexpected characteristic which is not predictable from the disclosure of the motor fuel or lubricant compositions of Franz.

Claims 1 and 11-21 were rejected under 35 U.S.C. 103 over Winter in combination with Patil. This rejection is respectfully traversed.

Winter relates to cyclic imides which are used as synergist for improving the properties of aqueous pigment preparations. The imides are those compounds of formula I and it will be appreciated that the scope of this formula is immense. Even if one simplifies that formula by ignoring the number of carbon atoms in numerous possibilities, possible substituents which can be present in numerous possibilities, identity of the halogen, and the various alternatives for R⁶, R⁷ and M, the number of permutations and combinations runs into the billions. Taking those possibilities into consideration increases the number into the trillions, if not more.

The Office Action states that when there is 1 particular combination where R², R⁴ and R⁵ in formula I are hydrogen, R³ is COOR⁶ and R⁶ is hydrogen, the imide is "based on" trimellitic acid. Since there is nothing in Winter which suggests these selections be made, that statement is in reality just an observation that formula I is sufficiently broad (i.e., generic) as to encompass trimellitic acid imides in addition to billions or trillions of other possibilities. Note further that when Winter provides guidance about what selections should be made at column 2, lines 37-42, trimellitic based compounds are excluded -- R³ can only be COOMe and cannot be COOH. Winter thus teaches away from the invention.

The Office Action suggests on page 4 that Winter suggests a reaction product of a polyalkylene amine “with [an] up to C30 aliphatic chain with” a cyclic anhydride. This is not accurate. Instead, Winter teaches the compound of formula I is the reaction product of a cyclic anhydride with a fatty amine at column 2, lines 44 et seq. Polyisobutylene amine (PIB) is not a fatty amine. The Office Action then continues by acknowledging that PIB is not disclosed but saying it is “encompassed” by Winter, i.e., the language in the reference is generic to PIB. The argument continues by averring the chain length is “comparable” to Winter’s chain, making the chains homologous, and therefore structural analogs which are *prima facie* obvious. It is respectfully submitted that this argument is not valid since it based on a hindsight reinterpretation which does not fairly reflect what would be understood by a person skilled in the art in an attempt to shoehorn Winter into the claims under consideration.

The Federal Circuit has observed that “a disclosure of millions of compounds does not render a claim to three compounds obvious, particularly when that disclosure indicates a preference leading away from the claimed compounds”, *In re Baird*, 29 USPQ2d 1550, 1552 (Fed. Cir. 1994). If 3 out of a million is not obvious, 1 out of a billion is certainly not obvious. Here, the number of combinations “encompassed” by Winter is huge, numbering far in excess of one billion, if not running into trillions or more, and Winter also teaches away from the invention by stating a preference for R³ to be COOMe.

Further, given the fact that the number of combinations and permutations falling within the scope of the Winter disclosure is immense, it constitutes, at the very best, a shotgun disclosure. The Board of Appeals has observed that “the likelihood of producing a composition such as here claimed from a disclosure such as shown by the ...patent [disclosing a very great number of permutations] would be about the same as the

likelihood as discovering the combination of a safe from a mere inspection of the dials thereof.” *Ex parte Garvey*, 41 USPQ 583, 584 (emphasis by the Board), quoted with approval in *In re Luvisi*, 144 USPQ 646 (CCPA 1965). A shotgun disclosure does not guide the skilled person to a specific composition so as to make that composition obvious, *Ex parte Strobel*, 160 USPQ 352 (Bd. App. 1968), *In re Baird*, 29 USPQ at 1552 (3 out of millions of possibilities compounds is not obvious). It is well established that an ability to reconstruct a composition without guidance or a reason to make selections is inadequate under Section 103, *Ex parte Levengood*, 28 USPQ2d 1300 (BPAI 1993), and this applies with even more force when a shotgun disclosure is involved. The recent Supreme Court decision in *KSR* and cases decided since that decision has not changed this.

After the *KSR* decision, the Federal Circuit reiterated that it does not constitute obviousness “to vary all parameters or try each of numerous possible choices until one possibly arrived at a successful result, where the prior art gave no indication of which parameters were critical or no direction as to which of the many possible choices is likely to be successful.” *PharmaStem Therapeutics v. ViaCell Inc.*, 83 USPQ2d 1289, 1305 (Fed. Cir. 2007) (quoting from *In re O’Farrell*, 7 USPQ2d 1673 (Fed. Cir. 1988) which “provides useful guidance for determining whether the expectation of success from a particular line of inquiry is great enough to render a resulting invention obvious.” 83 USPQ2d at 1305). Here, it would be necessary to try each of the numerous possible choices, and the direction suggested points away from the invention.

Rather than addressing the foregoing, the Advisory Action takes issue with the amine being a fatty amine, even though the reference itself says so, and merely asserts that Winter teaches a linear, branched or cyclic amine radical. It fails to mention that such a radical can be aliphatic or alkenyl, each of which can be substituted by 1, 2, 3, 4, or 5

substituents selected from alkyl, alkoxy, aryl, hydroxy, carboxy and sulfo. When that is taken into consideration, it confirms the applicants comments above. The Advisory Action's statement that Winter's amine can be "represented by polybutyleneamine (sic), since the reference teaches branched aliphatic radical" merely confirms the shotgun nature of the disclosure, and ignores the facts that (a) there is no mention at all of polyisobutyleneamine, and (b) Winter teaches away from use of any trimellitic based compounds.

Beyond all of the foregoing, the Office Action asserts that the Winter material is a "dispersant". There is no such teaching in this reference. As the title makes clear and the working example show, the material is a synergist for other ingredients in the dispersions, such as dispersants or surfactants. In this connection, see col. 4, lines 10-15 and note the designation of nonionic surfactants as dispersants in the working examples (e.g., col. 5, lines 61-62 and col. 7, lines 3-4). Winter states that the cyclic imides provide enhanced fluidity and flocculation stability of a pigment dispersion without degrading other properties such as dispersibility, a property that the prior art did not provide (col. 1, lines 40-44), not that they act to disperse a pigment. The Advisory Action ignores this consideration.

It will be appreciated from the foregoing that the Winter patent has at least two major deficiencies with respect to the claims being rejected. It does not teach or suggest selecting those reactants which form the reaction product claimed from the virtually unlimited scope of Formula I, and quite to the contrary, the stated preference for a dicarboxylic acid and fatty amines teaches away from making the appropriate selections. Secondly, while it teaches that the cyclic imides of Formula 1 do not degrade other

materials which are dispersants, it does not suggest that the cyclic imides themselves could act as a dispersant for a colorant.

Winter provides no *prima facie* basis for contending anything claimed in this application is obvious, and not only does the Patil fail to remedy the deficiencies of Winter, it actually reinforces them.

To the extent that Patil discloses any type of dispersant, it is a polyisobutylene succinimide, as the Examiner has pointed out. Succinic acid, however, is a dicarboxylic acid. The reference therefore reinforces Winter's teaching of using a dicarboxylic derived material whereas the dispersant of the present invention is derived from a tricarboxylic entity.

Winter teaches that an imide can be a synergist for a dispersant in a colorant composition. Patil discloses the use of an ashless dispersant (polyisobutylene succinimide) in a wide variety of oleaginous compositions. There is nothing in any portion of the Patil disclosure which teaches, suggests or even hints that any material disclosed therein can act as a dispersant for a colorant, much less that a polyisobutylene moiety extracted from the polyisobutylene succinimide ashless dispersant might have some value if substituted for a moiety in some ingredient in a colorant dispersion. There is no reason to attempt to modify anything in Winter by Patil.

The Advisory Action asserts that applicants argued Patil did not teach trimellitic anhydride. While that observation is actually correct, it is not what was argued. The rejection was based on trying to extract something from Patil for use in Winter, but no reason for extraction is given. Applicants' argument was, as stated in the proceeding

paragraph, that there was no valid reason to take anything from Patil and include it in Winter.

The reaction product of the present invention has excellent dispersing properties for a colorant used in, for example, printing inks. Nothing in the art teaches or suggests that such a reaction product may have these properties, and the fact that it does, is entirely unpredictable.

The deficiencies discussed above make it unnecessary to address other assertions made in the rejections.

In view of the above amendment, applicant believes the pending application is in condition for allowance.

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Respectfully submitted,

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